sure and force through the minute pore a jet of pollen "directly upon the rear or side of the intruder." He states that in experimenting a surprising quantity of pollen was thrown by touching the "bellows" with a blunt point.

PROF. C. E. BESSEY is making the Botanical Department of the *American Naturalist* more valuable than it has been for years. It is kept abreast with the times and botanists get hints of all that is doing in the botanical world.

THE AMERICAN MICROSCOPICAL JOURNAL for August contains a useful list of preservative solutions for botanical preparations. It is taken from *Brebissonia*, reprinted there from an opuscle published in 1872 by Messrs. Cornu, Gronland and Rivet. In the same number a few filterings of Croton water in August are shown to yield 24 species of Algæ, not to mention numerous Diatoms.

MR. J. G. BAKER has begun a synopsis of the genus *Pitcairnia* in the *Journal of Botany* for August. This is one of the largest genera of *Bromeliaceæ*, numbering now seventy species. In this first number a key to the species is given and eighteen of them described.

DR. GRAY gives in the last *American Journal of Science* a review of the third volume of DeCandolle's *Monographiæ Phaenogamarum*. This volume contains over 1000 pages and is mostly devoted to the two orders *Commelinaceæ* and *Cucurbitaceæ*. The former is by C. B. Clarke; the latter is the work of Cogniaux, of Belgium. The order *Commelinaceæ* contains 307 known species, arranged under 26 genera. The order is chiefly tropical, finding its most northern limits in the Northern United States or British America. Two thirds of the large volume is devoted to *Cucurbitaceæ*, an order which had been elaborated for the Prodromus by Seringe over fifty years ago. Since that time the material has increased tenfold, and of the 600 species M. Cogniaux describes 219, and has seen all but eight! Dr. Gray remarks: "The geographical distribution of a family at once so peculiar, so wide-spread and so considerable in numbers and generic diversity (79 genera and 600 species), might raise interesting speculations. It must be an ancient family; for the numerous genera, as well as the species, are circumscribed in range, and only six or seven are common to the Old and New World, except as diffused under human agency."

PROF. W. J. BEAL sets his students all to work, and the results of their observations form no mean contribution to botanical science. The latest we have noted are recorded in Meehan's *Gardener's Monthly* for September. Three students have been trying to answer the question, "Will red clover not visited by bees produce seeds?" The results of the experiments given seem to show that when guarded from bees the heads sometimes set seed, but always in very much diminished quantity.

Chapmannia and Garberia.—There is nothing more difficul than to describe a plant so that a person who has never seen it may

form a correct conception of its appearance. The characteristic *aspect* of a plant can only be described by comparison. The best of dried specimens fail to show all. That subtile quality which corresponds to expression is often wholly lost. This quality is sometimes of varietal importance, and its loss in drying often renders apparent a relationship difficult to perceive in the living plants. Detailed descriptions or field notes relative to most southern plants would hardly be admissable to the pages of the GAZETTE, but there are two plants with which I am sure its readers will be glad to be made better acquainted, because of their association, by name, with two of our most zealous botanists, namely, Dr. A. W. Chapman and Dr. A. P. Garber. This association appears the more fitting when we consider that these two plants are strictly Floridian, and that the botanists whose names they bear have distinguished themselves most by their labor s in Florida.

The *Chapmannia Floridana* and *Garberia fruticosa* are confined not only to Florida but to the center of that State. This range, however, is not nearly so limited as has been supposed. Dr. Chapman described both as growing in eastern Florida. In the course of my travels I have found *Chapmannia* in abundance from Fort Ogden, in Manatee Co., to Ocala, in Marion Co., a distance of 150 miles. *Garbéria* I have found on the western coast at Tampa, on the eastern coast near Matanzas, and in the interior near the Ocklawaha. *Garberia* grows only on "spruce-pine ridges," dry "heavy" sands, which make the worst of roads, and best suit that peculiar pine which Dr. Chapman has named *Pinus clausa*.

The *Chapmannia* grows in dry, open woods, and flowers through out May, June and July. Its flowers are showy, but few and ephemeral, otherwise the plant is uninteresting except to the botanist, who finds in it some very noticeable peculiarities. It is a slender plant, sparsely branched, with meager foliage, in habit much like *Desmodium rigidum*. Like most other *Leguminosæ* found in these pine woods, the roots bear slender tubers a few inches below the surface. The stems —one or more from a root—are slender, leafy below, above more or less branched and glandular-hirsute, the calices being quite viscid. The leaves are pubescent beneath. 1′–2′ long, pinnately 3–7 foliolate, and are provided with subulate persistent stipules. The leaflets vary from one-fourth of an inch to nearly one inch in length; they are mostly obovate or oval and obtuse, but they vary from orbicular to narrowly lanceolate, and from acute to retuse, always mucronate and petiolulate. So far we find no marked peculiarities. Let us now proceed to the inflorescence, where generic characters are to be looked for, and note such features as are not mentioned in Chapman's description. That author does injustice to the flowers of his plant; instead of being "small," the perfect flowers are quite large, often an inch and a half in width. Their color is a deep rich yellow, like those of *Stylosanthes*. They open early in the morning, perhaps in the night, and in sunny weather are closed by nine o'clock, scarcely outlasting the dew. As the keel is closely wrapped around the stamens, the flower appears to be tripetalous, the other three large petals spread-

ing in a plane, or being reflexed as in *Cyclamen*. The apparent peduncles are about an inch in length, but these are really peduncle-like branches or the axes of 1–3 flowered racemes, the pedicels being only a line in length, bracted at the base, thickening under the fertile flowers into top-shaped receptacles. When there is more than one flower the terminal one is sterile the lower and fertile flowers consisting of a pistil only. The legume is somewhat moniliform and consists of from one to four joints, each about one-fourth of an inch long, hispid, the terminal one beaked. The joints disarticulate as readily as do those of *Tripsacum*, the articulations being tumid and oblique, the scars oval and white.

As to the *Garberia* I cannot add much to the published descriptions. It is a shrubby Composite, of cinereous color, unique among cis-Mississippi plants, but similar to some of the shrubby *Compositæ* of the far west. It grows on sterile, sandy ridges, where it forms compact bushes two to four feet in height, with numerous stems and branches, its mode of branching being Ericaceous, like *Azalea*, etc. It is quite leafy, the leaves being obovate and only about an inch in length. The corymbose flowers appear in the fall and are of a dull purple color. It is singular that Nuttall should have called this plant a *Liatris*. Many botanists have considered that great similarity of floral structure is unquestionable evidence of generic identity, and this opinion has led to some very artificial grouping of species. Prof. Gray did well in separating *Liatris fruticosa* from the rest of that genus. It was also highly proper to take out the species *odoratissima* and *paniculata*, but the propriety of erecting a new genus for them is questionable. Familiarity with these plants in the field leads me to believe that their natural position is in the genus *Carphephorus*, to species of which each is closely allied. Only a slight change of generic characters would have been required to establish this very natural group.

—A. H. CURTISS.

Botanical Notes, from Rev. E. J. Hill, Englewood, Illinois.—*Anemone multifida*, DC. Found in flower August 10, 1878, on the sandy beach of Grand Traverse Bay, near the landing at Torch Lake, Mich. A number of specimens were gathered in various states of flower and fruit, showing that it had not ceased blooming since the time it began to flower in early summer.

Cadramine hirsuta, L., var. *sylvatica*. The smooth form, like the original *C. Virginica* described by Michaux, grows in dry, open woods at Highland Park, north of Chicago. It is usually found farther south.

Lepidium campestre, L. Adventive by Ft. Wayne R. R., at Englewood. Only a few plants found.

Hibiscus Moscheutos, L. This plant, with a large and showy flower, grows luxuriantly by Lake George, and in the adjacent swamps near Whiting, Lake county, Indiana. The plants were often five feet or more in height, and the flowers larger than those of the common Hollyhock. I saw it in cultivation at Bear Lake, Manistee county, Mich., in August, 1880. It was brought by emigrants from Ohio. As the land was comparatively dry, and the height of the plants three